

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

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B1  
1                   1.       (currently amended) A computer-implemented method for the  
2 identification of identifying whether a test subject is a systemic autoimmune disease in a test  
3 subject suspected of suffering from an otherwise unidentified one or more systemic autoimmune  
4 diseases disease selected from the group consisting of systemic lupus erythmatosus, scleroderma,  
5 Sjögren's syndrome, polymyositis, dermatomyositis, CREST, and mixed connective tissue  
6 disease, said method comprising:

7                   (a) receiving a test data set for the test subject, wherein the test data set is  
8 obtained from a biological sample of the test subject and wherein the test data set has  
9 values representing levels of a plurality of autoantibodies, analyzing a single biological  
10 sample from said test subject for the presence and amounts of a plurality of  
11 autoantibodies to produce a test data set;

12                  (b) storing a plurality of comparing said test data set to a library of reference data  
13 sets, each reference data set obtained from a biological sample of a reference subject  
14 known to have a systemic autoimmune disease of known identity, wherein each reference  
15 data set has values representing levels of the plurality of autoantibodies, and wherein  
16 each reference data set is associated with one or more of said systemic autoimmune  
17 diseases; and

18                  (c) comparing the test data set and the reference data sets by applying pattern  
19 recognition means selected from the group consisting of a k-nearest neighbor process  
20 analysis, multi-linear regression analysis, Bayesian probabilistic reasoning, and principal  
21 component analysis to produce a statistically derived decision indicating whether the  
22 which systemic autoimmune disease said test subject is suffering from one or more of  
23 said systemic autoimmune diseases.

1                    2.        (currently amended) A method in accordance with claim 1 in which said  
2 ~~test subject is suffering from two otherwise unidentified systemic autoimmune diseases, and step~~  
3 ~~(c) comprises applying pattern recognition means to produce~~ produces a statistically derived  
4 decision indicating ~~which two systemic autoimmune diseases~~ whether said test subject is  
5 suffering from two of said systemic autoimmune diseases.

1                    3.        (canceled)

1                    4.        (canceled)

1                    5.        (original) A method in accordance with claim 1 in which said plurality of  
2 autoantibodies numbers from 10 to 100 autoantibodies.

1                    6.        (original) A method in accordance with claim 1 in which said plurality of  
2 autoantibodies numbers from 15 to 25 autoantibodies.

1                    7.        (previously presented) A method in accordance with claim 1 in which  
2 said plurality of autoantibodies comprises antibodies to at least fifteen of the following antigens:  
3                    SSA 60,  
4                    SSA 52,  
5                    SSB 48,  
6                    Sm BB',  
7                    Sm D1,  
8                    RNP 68,

9 RNP A,  
10 RNP C,  
11 Fibrillarin,  
12 Riboproteins P0, P1, and P2,  
13 dsDNA,  
14 Nucleosome,  
15 Ku,  
16 Centromere A,  
17 Centromere B,  
18 Scl-70,  
19 Pm-Scl,  
20 RNA-Polymerases 1, 2, and 3,  
21 Th,  
22 Jo-1,  
23 Mi-2,  
24 PL7,  
25 PL12, and  
26 SRP.

1 8. (previously presented) A method in accordance with claim 1 in which  
2 said plurality of autoantibodies comprises antibodies to each of the following antigens:

3 SSA 60,  
4 SSA 52,  
5 SSB 48,  
6 Sm BB',  
7 Sm D1,  
8 RNP 68,  
9 RNP A,  
10 RNP C,

.11 Fibrillarin,  
12 Riboproteins P0, P1, and P2,  
13 dsDNA,  
14 Nucleosome,  
15 Ku,  
16 Centromere A,  
17 Centromere B,  
18 Scl-70,  
19 Pm-Scl,  
20 RNA-Polymerases 1, 2, and 3,  
21 Th,  
22 Jo-1,  
23 Mi-2,  
24 PL7,  
25 PL12, and  
26 SRP.

1 9. (currently amended) A method in accordance with claim 1 in which said  
2 ~~library of~~ reference data sets represent ~~represents~~ from 100 to 10,000 biological samples from  
3 reference subjects known to have systemic autoimmune diseases of known identity.

1 10. (currently amended) A method in accordance with claim 1 in which said  
2 ~~library of~~ reference data sets represent ~~represents~~ from 200 to 2000 biological samples from  
3 reference subjects known to have systemic autoimmune diseases of known identity.

B1 1 11. (canceled)

1                   12.     (original) A method in accordance with claim 1 in which said biological  
2 sample from said test subject is a member selected from the group consisting of serum, plasma,  
3 urine, and cerebrospinal fluid.

1                   13.     (original) A method in accordance with claim 1 in which said biological  
2 sample from said test subject is serum.

1                   14.     (currently amended) A method in accordance with claim 1 in which ~~step~~  
2 ~~(a) is performed~~ the test data set is based on analysis by immunoassay.

1                   15.     (currently amended) A method in accordance with claim 1 in which ~~step~~  
2 ~~(a) is performed~~ the test data set is based on analysis by immunoassay with fluorescence  
3 detection.

1                   16.     (currently amended) A method in accordance with claim 1 in which said  
2 one or more systemic autoimmune ~~disease is~~ diseases consists of systemic lupus erythmatosus.

1                   17.     (New) A computer-implemented method of diagnosing whether a test  
2 subject is suffering from one or more systemic autoimmune diseases selected from the group  
3 consisting of systemic lupus erythmatosus, scleroderma, Sjögren's syndrome, polymyositis,  
4 dermatomyositis, CREST, and mixed connective tissue disease, said method comprising:  
5                   (a) receiving a test data set for the test subject, wherein the test data set is  
6 obtained by analysis of a biological sample of the test subject and wherein the test data  
7 set has values representing levels of each of a plurality of autoantibodies;

8 (b) storing a plurality of reference data sets to a database, wherein each reference  
9 data set is obtained by analysis of a biological sample of a reference subject known to  
10 have a systemic autoimmune disease of known identity, wherein each reference data set  
11 has values representing levels of each of the plurality of autoantibodies, and wherein each  
12 of the reference data sets is associated with one or more of said systemic autoimmune  
13 diseases; and

14 (c) applying a k-nearest neighbor process to the test data set and the reference  
15 data sets from the database to produce a statistically derived decision indicating whether  
16 the test subject is suffering from one or more of said systemic autoimmune diseases.

1 18. (New) The method of claim 17, wherein the autoantibody levels in the  
2 test and reference data sets are determined using the same multianalyte analysis tests.